II. CLAIMS

1. (Previously Presented) A method for the non-invasive early detection of colon cancer or intestinal cancer precursor cells by means of mutational analysis of the genes for APC, K-ras, ß-catenin and B-raf in a sample, characterized in that the method comprises the following steps:

collecting a stool sample,

homogenizing the sample,

obtaining DNA from the sample,

performing an amplification reaction in the genes for APC, K-ras, ß-catenin and B-raf,

using the primers

SEQ ID NO. 1

SEQ ID NO. 2

SEQ ID NO. 3

SEQ ID NO. 4

SEQ ID NO. 5

SEQ ID NO. 6

SEQ ID NO. 7

SEQ ID NO. 8

SEQ ID NO. 9

SEQ ID NO. 10 or alternatively

SEQ ID NO. 15

SEQ ID NO. 16 for APC,

the primers

SEQ ID NO. 11

SEQ ID NO. 12

for K-ras, the primers

SEQ ID NO. 13

SEQ ID NO. 14

for ß-catenin, and the primers

SEQ ID NO. 17

SEQ ID NO. 18 for B-raf,

wherein amplification products are formed, and performing a mutational analysis in the amplification products.

2. (Previously Presented) The method according to claim 1, characterized in that the detection of mutations in selected sections of the genes for APC, K-ras, ß-catenin and B-raf is effected by means of a DNA chip, said DNA chip including probes for APC, K-ras, ß-catenin and B-raf from those regions of the above-mentioned genes that are flanked by the primer sequences specified in claim 1.

3. (Previously Presented) The method according to claim 1, characterized in that the APC, K-ras, ß-catenin and B-raf genes are accumulated from total DNA by hybridizing sequence-specific biotinylated oligonucleotides with the genes for APC, K-ras, ß-catenin and B-raf using coupling of the biotin residue to streptavidin and subsequent separation via magnetic particles.

4. (Previously Presented) The method according to claim 1, characterized in that amplification products, especially PCR products, are separated in an agarose gel for control purposes prior to purification.

5. (Currently Amended) The method according to claims 1, characterized in that the mutational analysis of the PCR products is effected using electrophoretic techniques, ~~preferably SSCP,~~ alternatively by means of a chromatographic procedure~~, preferably an HPLC based procedure~~.

6. (Previously Presented) The method according to claim 5, characterized in that detected mutagenic conformations of a single strand are isolated and optionally sequenced.

7. (Previously Presented) Primer sequences selected from the group comprising:

the primers
SEQ ID NO. 1
SEQ ID NO. 2
SEQ ID NO. 3
SEQ ID NO. 4
SEQ ID NO. 5
SEQ ID NO. 6
SEQ ID NO. 7
SEQ ID NO. 8
SEQ ID NO. 9
SEQ ID NO. 10 or alternatively
SEQ ID NO. 15
SEQ ID NO. 16
for APC, the primers
SEQ ID NO. 11
SEQ ID NO. 12
for K-ras, the primers
SEQ ID NO. 13
SEQ ID NO. 14
for ß-catenin, and the primers
SEQ ID NO. 17
SEQ ID NO. 18
for B-raf.

8. (canceled)

9.(Previously Presented) A kit, comprising primers selected from the group comprising:

the primers

SEQ ID NO. 1

SEQ ID NO. 2

SEQ ID NO. 3

SEQ ID NO. 4

SEQ ID NO. 5

SEQ ID NO. 6

SEQ ID NO. 7

SEQ ID NO. 8

SEQ ID NO. 9

SEQ ID NO. 10 or alternatively

SEQ ID NO. 15

SEQ ID NO. 16

for APC, the primers

SEQ ID NO. 11

SEQ ID NO. 12

for K-ras, the primers

SEQ ID NO. 13

SEQ ID NO. 14

for ß-catenin, and the primers

SEQ ID NO. 17

SEQ ID NO. 18

for B-raf,

and optionally information relating to combining the contents of the kit.

10. (canceled)

11. A method for the detection of colon cancer or colon cancer precursor cells using the kit according to claim 9.

12. (New) The method of claim 5 where the electrophoretic techniques is SSCP.

13. (New) The method of claim 5 where the chromatographic procedure is an HPLC-based procedure.

14. (New) The method of claim 1 using the primers SEQ ID NO. 15 and SEQ ID NO. 10 for APC, the primers SEQ ID NO. 11 and SEQ ID NO. 12 for K-ras, the primers SEQ ID NO. 13 and SEQ ID NO. 14 for ß-catenin, and the primers SEQ ID NO. 17 and SEQ ID NO. 18 for B-raf.